

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of: Sherman et al  
Serial Number: 10/783,328  
Filing Date: February 20, 2004  
Art Unit: 2171  
Examiner: Shaw, Peling Andy  
For: **Highly scalable, fault-tolerant file transport using vector-exchange**

Mail Stop Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**RESPONSE TO NON-FINAL OFFICE ACTION**

This paper responds to the Office action mailed April 29, 2009.

Reconsideration and favorable action are requested.

**REMARKS**

Claims 1 and 5-8 are rejected under 35 USC §103(a) as being unpatentable over Jeffords, U.S. Publication No. 20010042139 in view of Janis, U.S. Patent No. 5,263,165, Satyanarayan et al, U.S. Patent No. 6,662,198, and Phillips, U.S. Patent No. 7,058,696.

Claims 9-10 and 13-17 also are rejected under 35 USC §103(a) as being unpatentable over Jeffords, Janis, Satyanarayan and Phillips.

Dependent claim 18 is rejected under 35 USC §103(a) as being unpatentable over Jeffords, Janis, Satyanarayan and Phillips, as applied to independent claim 9, further in view of Snyder, U.S. Patent No. 6,643,641.

With respect, each of these rejections is traversed.

Turning first to the “Response to Arguments” at page 15, the Examiner errs in concluding that the recited “timeout function” is a “standard messaging based software

technique” because the “timeout function” per se is not what is being claimed. Rather, the claims recite particular method steps that must take place within the “timeout period.” The Examiner’s citation of a “timer or heartbeat” (referencing Phillips and Snyder) is inapposite. The “timeout” is claimed in the context of one or more particular steps of the recited methods; and it is the claimed subject matter that must be considered, not words or concepts in the abstract.

Stated another way, “[e]very limitation positively recited in a claim must be given effect in order to determine what subject matter that claim defines.” *In re Wilder*, 429 F.2d 447, 450 (CCPA 1970); *See also In re Wilson*, 424 F. 2d 1382, 1385 (CCPA 1970) (“[a]ll words in a claim must be considered in judging the patentability of that claim against the prior art.”).

The Examiner’s qualification regarding the “timeout period” limitation (“this seems to be [present in the cited art]” at page 15) is telling. The references do not teach the specific “timeout” function in the actual context that is positively recited in each of claims 1 and 9. Accordingly, the Examiner has failed to establish a prima facie case of obviousness with respect to the subject matter “as a whole” of either claim.

The “test for obviousness is what the combined teachings of the references would have suggested to one of ordinary skill in the art.” *In re Young*, 927 F.2d 588, 591 (Fed.Cir.1991).

Jeffords describes a method and apparatus for accessing resource objects contained in a distributed memory space in a communications network. A “resource object” is a software object whose data may be important [0223]. In this system, the distributed memory space is divided into a plurality of memory pools, with each pool containing a collection of resource objects [0221]. A plurality of resource manager objects are also provided, with each resource manager object having an associated set of memory pools and a registry of network unique identifiers for the resource objects in those pools. A resource manager provides a registry of resource objects and a mechanism for communicating with other resource managers [0217]. The patent application also describes that the system affords a so-called “relativistic view” of state of a plurality of objects, where each object generates a state vector representing that object's view of its own state and the state of all

other objects [0013]. Using a “state vector exchange protocol,” each object sends its state vector to other objects, and each object maintains a state matrix of the state vectors [0057].

Figure 4 in Jeffords illustrates a state vector generated by an object A. In this example, object A thinks itself to be in state 1 and thinks object B is in state n, object C is in state 3, and object D is in state 2 [0180]. Figure 5 is a representative state matrix generated by the combination of state vectors for objects A through D. In this case, each object has provided a state vector (row) to the matrix. The column vector for object A indicates that object A thinks itself to be in state 1, object B thinks object A is in state 3, object C thinks object A is in state n, and object D thinks object A is in state 3 [0185].

In Jeffords, it is assumed that a distributed application runs with one or more processes at any given time. On start up, each process initializes an internal contact status matrix (CSM) and attempts to contact a set of other processes. Figure 8 illustrates a method for updating state information in this matrix. The method begins by having a particular process (process 1) update its own contact status vector. Next, the process 1 attempts to contact the other systems. If a contact to another system is successful, the process 1 updates its own state vector to provide this indication. The process 1 then sends out a copy of its state vector to the other systems, e.g., processes 2-n (107). Then, process 1 continues to contact other systems (108); when all processes have been attempted to be contacted, the method ends. Using the discovery process, each process learns about the relative state of all other processes in the network. In particular, and as described at [0057], this “is done through a resource manager state vector exchange protocol, i.e., the use of state matrices filled by the vectors received at each resource manager ... Once a stable (deterministic) network state has been achieved (all active ... processes are reporting the same state information about each other), synchronization of resource pools is initiated.”

In Jeffords, and as described in the flowchart of Figure 8, an individual process attempts to contact other processes (that will be required for use by the distributed application), and that process updates its own state vector accordingly before transmitting that updated vector to the other processes. In Jeffords, and with all due respect to the Examiner’s interpretation, a process does not receive a state vector passed from some other

process which it then modifies - e.g., by writing into the received vector its own state information. Moreover, in Jeffords, running the state vector exchange protocol appears to be for the purpose of ensuring that the active processes know when they are reporting the same state information about each other; this enables the system there to initiate operation of the distributed application that will use these processes. The protocol is not, as in the subject disclosure, establishing a guarantee that the servers (that have modified the bits in the knowledge bit vector) have reached an agreement that a file submit process can now proceed. Indeed, the distributed application in Jeffords has nothing to do with file submission; rather, Jeffords describes a distributed call management application [0209] or a text-based conferencing application [0210].

Jeffords does not teach that his state vector exchange protocol must be carried out within a given timeout period. Rather, the reference appears to teach the opposite: [0052] the “processes that compose an RRM system may be started in a completely asynchronous manner, that is, they may be started in any order and at any time.”

Turning to the secondary references, Janis is cited for its teaching of “access control on system resources such as files within a distributed data processing system having multiple resource managers.” Satyanarayanan discloses a system and method for asynchronously sharing, backing up, and distributing data based on immutable entries. The reference is cited for its teaching of transmitting in bits and using a bit to indicate file status, such as the archive status of a backup. Philips is cited for its teaching of “encoding given information about [a] file into a temporary identifier and having the identifier output to each of a set of servers to which a server has connectivity,” as well as “time out on version/access request and/or file download.” Snyder teaches file downloading and the use of a timer to wait a predetermined time before capturing a rendered image (see, e.g., column 25, lines 39-41). The Examiner’s reading of each secondary reference, in of itself, is not contested. Moreover, because “[n]on-obviousness cannot be established by attacking references individually where the rejection is based upon the teachings of a combination of references,” *In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed.Cir.1986), the undersigned will not attack the combination(s). Rather, the issue here is the deficiency in the primary reference Jeffords.

As noted above, the patent does not address file submissions across a distributed computer network, nor does it disclose any type of distributed agreement protocol involving the modifying of a received bit vector, let alone such a protocol using vector exchange where the exchange must be carried out within a given timeout period.

Further, with respect to claim 9, there are now two (2) distinct timeout periods, a “first” timeout during which the “file push” (which is not claimed in claim 1) must complete, and a “second” timeout during which the vector agreement protocol must complete. No reference of record describes these features, thus, the combination “as a whole” cannot either.

Thus, Jeffords/Janis/Satyanarayan/Phillips still lacks at least the following limitations now positively recited in the claims:

Claim 1:

“in response to receipt of a submission of a file at a given server, accepting the submission at the given server only if a given subset of the set of distributed servers reach an agreement to the submission within a given timeout period, where the agreement is determined using a data exchange protocol that includes sub-steps as follows:

passing a bit vector from a first server to a second server, the bit vector including a first indication that the first server has knowledge of the file;

upon receipt of the bit vector at the second server, having the second server modify the bit vector to include, together with the first indication, a second indication that the second server also has knowledge of the file;

having the second server pass the bit vector, which includes the first and second indications, to one or more other servers in the given subset; and

upon a given state being reached, as indicated by at least the first and second indications in the bit vector, determining that the agreement has been reached within a given timeout period;”

Claim 9:

“if the file has been successfully pushed to each of the other servers within a first timeout period, having the given server initiate a data exchange protocol to each of the

other servers to which the given server has connectivity, where the data exchange protocol includes sub-steps as follows:

passing a knowledge bit vector among the given server and the other servers;

having each server that receives the knowledge bit vector modify the knowledge bit vector to indicate that server's knowledge of the file; and

based on the knowledge bit vector as modified, determining whether a quorum of the servers have reached a given state within a second timeout period;

and

if the quorum of servers reach the given state within the second timeout period, accepting the file for submission."

Regarding claim 18, the Examiner's conclusion of obviousness is incorrect. Snyder merely teaches employing a "timer to wait a predetermined time before capturing [a] rendered image." The contention that this simple teaching is the same thing as specifying a "time period [that] is a function of a size of the file" is classic hindsight, based on the wording of the claim, not the teachings in the references or the level of ordinary skill in the art. This is impermissible. The combination of the teachings in the five references still lack the "timeout period" limitations in claim 9, as will as the following limitation:

Claim 18:

"wherein the first timeout period is a function of a size of the file."

For these reasons, a Notice of Allowance is respectfully requested.

Respectfully submitted,

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ATTORNEYS FOR APPLICANT

October 29, 2009